NATIONAL WEATHER SERVICE WESTERN REGION SUPPLEMENT 12-2003
APPLICABLE TO NWSI 10-310
NOVEMBER 11, 2005

Operations and Services
Marine and Coastal Weather Services, NWSPD 10-3
Coastal Marine Forecast Services, NWSI 10-310

MARINE WEATHER SERVICES

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OPR: W/WR1x4 (J. Lorens) **Certified by:** W/WR1 (R. Douglas)
Type of Issuance: Routine

SUMMARY OF REVISIONS: This directive supersedes NWS Western Region Supplement 12-2003 dated July 31, 2003.

The following changes were made in this issuance:

1. Added "Hazardous Seas Warning" information.
2. Added "Small Craft Advisory for Wind" and "Small Craft Advisory for Rough Bar" information.
3. Removed information on "effective periods for Small Craft Advisories and Gale/Storm/Hurricane Force Wind Warnings".

Signed 10/27/05
Vickie Nadolski Date
Director, Western Region

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1. Introduction. This regional supplement provides additional guidance and instructions for marine weather products and services including Coastal Waters Forecasts and Surf Zone Forecasts. Written instructions cannot address every situation. Operational personnel must exercise initiative and professional judgment to minimize risk to public safety and property in instances when written instructions do not provide appropriate guidance. Personnel must balance safety and needs of customers against frequency of warnings and possible constraint of travel and commerce. Protection of life and property will take precedence in these decision-making processes.

2. Coastal Waters Forecasts (CWF).

2.1 Issuance. Western Region (WR) Weather Forecast Offices (WFOs) use the Interactive Forecast Preparation System (IFPS) to prepare coastal waters forecasts (CWFs) for their marine areas of responsibility. Scheduled issuance times are: 0300/0900/1500/2100 (Local Time).

CWFs will be issued no earlier than one hour prior to, but no later than scheduled issuance times. Unscheduled (updated or corrected) CWFs will be issued as necessary. Gridded marine elements will be updated as needed to ensure currency.

2.2 CWF Format. NWSI 10-310 provides instructions for general CWF format. Additionally, specific WR format instructions are as follows:

2.2.1 Combining Forecast Periods. The first forecast period will stand alone (for emphasis on the short term, and to better facilitate short term updates, if required). The second and third forecast periods may be combined if wind, wave, and weather conditions are similar. Any of the forecast periods *beyond third period* may also be combined. Do NOT combine the third and fourth forecast periods, due to the exclusion of swell period in the fourth and later forecast periods.

2.2.2 Reference to National Marine Sanctuaries. WFOs Los Angeles, San Francisco Bay Area, and Seattle will reference National Marine Sanctuaries in their areas of responsibility in the SYNOPSIS description line or in the areal description line of the Mass News Disseminator (MND).

2.3 CWF Content.

2.3.1 Synopsis. WR WFOs will include a brief synopsis discussing the dominant weather features affecting the WFOs coastal waters area of responsibility, including general trends (movement, intensification, weakening, etc.). Primary emphasis will be placed on the first 36-48 hours of the forecast, but weather features expected to result in a significant degradation or improvement of forecast conditions beyond 48 hours, particularly with reference to hazardous wind and/or sea conditions, should also be mentioned.

2.3.2 Forecast Content.

a. Wind. Wind will be included for all periods of the CWF.

1. Speed. Wind speeds will be rounded to the nearest 5 knots. A range of speeds may be used, but it should be limited to 10 knots (for example, SW WIND 20 to 30 KT). If wind speeds are expected to exceed this range (for example, due to a rapid increase or decrease), lower and upper bounds should be specified (for example, SE WIND 10 KT INCREASING TO 30 KT).

2. Gusts. Significant differences between sustained winds and peak gusts (10 knots or more) should be included when expected (for example, NW WIND 20 KT GUSTING TO 30 KT), particularly when crossing advisory or warning thresholds. *Exception:* Inland bays and waters may use larger ranges when appropriate to clearly depict expected conditions.

3. Direction. A single prevailing wind direction should be used, unless a wind shift is predicted during the forecast period. A small range of wind

direction (e.g., 45 degrees, "W-NW") may be used in areas affected by topography (e.g., bays, channels, etc.).

b. Seas. Seas will be included for all forecast periods, as described below. *Exception:* Inland waters and bays are exempted from having detailed sea state predictions and may use a general description of wave conditions (e.g. steep or rough), when it helps to convey the severity of a given situation. In WR, inland waters include Puget Sound and Hood Canal, Admiralty Inlet, the Strait of Juan de Fuca, the San Juan Islands (Camano Island to Pt. Roberts), San Francisco Bay, San Pablo Bay, Susuin Bay and the West Delta (Sacramento/San Joaquin Rivers). For these purposes, the terms "steep", "rough", and "moderate" refer to situations in which the dominant period (in seconds) is equal to or less than the wave height (in feet).

1. Swell height (feet) and direction. Swell direction is the direction the wave energy is coming from, based on an eight-point compass. Swell information will be included for all forecast periods, except as noted in paragraph 2.3.2.b.5. (Combined Seas), below. A maximum height range of 2 feet should be used for swell heights less than 10 feet. A 3-foot range may be used for heights of 10 feet or higher (e.g. 8 to 11 feet, 15 to 18 feet, etc.). Exceptions: (1) When rapidly building or subsiding trends are forecast, i.e. in a single forecast period, indicate lower and upper bounds for swell height, e.g., W SWELL 7 FT at 10 SECONDS...BUILDING TO 15 FT and (2) In the vicinity of major points of land and large islands, larger ranges may be used as appropriate to describe swell, but should be minimized whenever possible.

2. Swell period (seconds). Swell period will be included during the first three forecast periods (Note: When **combined seas** are used, substitute **dominant period** for swell period). A maximum range of 2 seconds should be used, except when rapid period change is expected in a single forecast period (for example, W SWELL 8 FT AT 10 SECONDS... BUILDING TO 15 FT AT 17 SECONDS).

3. Mixed Swell. A secondary swell should also be included if it can be clearly identified. In such cases, specify the predominant swell first, then the secondary swell. Include a direction, height, and period for each swell (in accordance with instructions above). As general guidance, include a secondary swell if it differs from the primary swell by 90 degrees or more, the height of the secondary swell is at least half the height of the primary swell, or if it poses a special hazard (e.g. shoaling in shallower depths due to longer period).

4. Wind wave height (feet). Wind wave height will be included for all forecast periods, except as noted in paragraph 2.3.2.b (Seas) and 2.3.2.b.5 (Combined Seas). A maximum range of 2 feet should be used, except

when a rapidly building or subsiding trend is forecast in a single forecast period (for example, WIND WAVES 2 FT...BUILDING TO 4 TO 6 FT).

5. Combined seas (combination of swell height and wind wave height, typically synonymous with **significant wave height**). The term "combined seas" will be substituted for the combination of ***swell*** and ***wind wave*** when the two cannot be clearly distinguished. Example situations may include (1) a combination of wind wave and short period swell (also known as "fresh swell") or (2) when several swells are present with no single swell predominant. Gale-force (or stronger) winds also commonly result in situations where seas are confused. Forecasters are otherwise discouraged from using "combined seas".

c. Significant Weather / Visibility. Refer to NWSI 10-310.

2.4 River/Bay Bar Forecasts. Certain areas along the California, Oregon, and Washington coasts, especially near (or at) the entrance to rivers and bays, are identified as "bars". These areas may have significantly different wave conditions than surrounding coastal waters. For these areas, specific wave forecasts and related information (e.g. tidal information), may be included in the CWF. Some river/bay bars have unique marine zones assigned to them, while others may be part of an existing coastal waters marine zone.

The following is an example of a bar forecast for a unique marine zone (a separate segment within the CWF):

PZZ210-191615-
/X.ROU.KPQR.MA.F.0000.000000T0000Z-000000T0000Z/
COLUMBIA RIVER BAR-
330 AM PDT WED OCT 19 2005

IN THE MAIN CHANNEL...COMBINED SEAS 5 FT TODAY AND TONIGHT. HOWEVER...COMBINED SEAS NEAR 8 FT DURING THE EBB AROUND 630 AM THIS MORNING...AND NEAR 9 FT WITH BREAKERS POSSIBLE DURING THE VERY STRONG EBB AT 645 PM THIS EVENING.

The following is an example of a bar forecast for an area which is part of an existing coastal waters marine zone (appended to segment):

PZZ550-060545-
/X.NEW.KMTR.RB.Y.0012.051005T2250Z-0510062300Z/
POINT ARENA TO PIDGEON POINT TO 20 NM-
250 PM PDT WED OCT 5 2005

...SMALL CRAFT ADVISORY FOR ROUGH BAR IN EFFECT UNTIL THURSDAY AFTERNOON FOR THE SAN FRANCISCO BAR...

.TONIGHT...NW WINDS 10 TO 20 KT. WIND WAVES 2 TO 4 FT. W SWELL 7 TO 9 FT AT 17 SECONDS.
.THU...NW WINDS 10 TO 20 KT. WIND WAVES 2 TO 4 FT. NW SWELL 7 TO 9 FT AT 15 SECONDS.
.THU NIGHT...NW WINDS 10 TO 20 KT. WIND WAVES 2 TO 4 FT. NW SWELL 7 TO 9 FT AT 11 SECONDS. PATCHY FOG AFTER MIDNIGHT.
.FRI...NW WINDS 15 TO 25 KT. WIND WAVES 3 TO 5 FT. NW SWELL 8 TO 10 FT. PATCHY MORNING FOG.
.FRI NIGHT...NW WINDS 15 TO 25 KT. WIND WAVES 3 T0 5 FT. NW SWELL 9 TO 11 FT. PATCHY FOG.
.SAT...NW WINDS 15 TO 25 KT. WIND WAVES 3 TO 5 FT. NW SWELL 10 TO 12 FT. PATCHY NIGHT AND MORNING FOG.
.SUN...NW WINDS 10 TO 20 KT. WIND WAVES 2 TO 4 FT. NW SWELL 8 TO 10 FT.
.COLUMBUS DAY...NW WINDS 10 TO 20 KT. WIND WAVES 2 TO 4 FT. NW SWELL 6 TO 8 FT.

.SAN FRANCISCO BAR/FOURFATHOM BANK FORECAST...
.IN THE DEEP WATER CHANNEL...COMBINED SEAS 6 TO 8 FT TONIGHT AND THURSDAY.
.ACROSS THE BAR...COMBINED SEAS 9 TO 12 FT TONIGHT AND THURSDAY... TEMPORARILY BUILDING TO 14 FT DURING THE EBB CURRENT AROUND 615 PM TONIGHT AND 645 AM THURSDAY MORNING.

2.5 Headlines. Refer to NWSI 10-310 and NWSI 10-1701, Appendix A for general guidance on marine headlines.

2.5.1 Hazardous Sea Warnings: "Hazardous Sea Warnings" may be issued by WR coastal WFOs when existing or expected wave conditions pose a heightened threat to life and property. Similar to "Small Craft Advisories for Hazardous Seas" (SCAHS - - see below), "Hazardous Seas Warnings" are based on a combination of wave height and/or steepness, but criteria are more severe than for SCAHS. Wave steepness is defined as "the ratio of wave height to wave length" (ref: NWSI 10-301). Similar to other types of Marine advisories/warnings, the "Hazardous Seas Warning" is issued via a headline for affected marine zones in the Coastal Waters Forecast (CWF) and will follow the general guidelines as for other types of marine warnings (excluding Special Marine Warnings). If used, WFOs will define criteria, based on customer requirements, and inform NWS Western Region HQ (MSD) of their criteria (also if criteria changes). Note: Concerning the Valid Time Event Code (VTEC), the Hazardous Seas Warning (VTEC code "SE.W"), is considered equivalent to a Gale Warning (VTEC code "GL.W") for upgrade/downgrade purposes.

2.5.2 Small Craft Advisories. Small Craft Advisories will be issued as needed, using criteria described below. Refer to NWSI 10-310 for guidance on effective forecast periods for headlines.

a. "Small Craft Advisory" and "Small Craft Advisory for Wind". WR WFOs have the option of using "Small Craft Advisory" or "Small Craft Advisory for Wind", when only the wind speed threshold is expected to be met or exceeded. The wind speed threshold for WR is 21 to 33 knots, inclusive. Note: Gusts should occur

for at least two hours in any given forecast period to be considered "frequent" (Ref: NWSI 10-301). WFOs may use up to 25 knots as the lower threshold of this range, based on customer requirements.

b. Small Craft Advisory for Hazardous Seas (SCAHS). "Small Craft Advisory for Hazardous Seas" is based on wave height, or wave height in conjunction with wave steepness. Wave steepness is defined as "the ratio of wave height to wave length" (Ref: NWSI 10-301). If wave height is used as the sole criteria for SCAHS, the WR threshold is 10 feet. If wave steepness is used in conjunction with wave height, WFOs will define specific criteria, based on customer requirements, and inform NWS Western Region HQ (MSD) of their criteria (also if criteria changes).

c. Small Craft Advisory for Rough Bar. A special headline for rough bar conditions, "Small Craft Advisory for Rough Bar" is reserved for coastal WFOs issuing bar forecasts (see 2.4, "River/Bay Bar Forecasts"). Criteria for this type of Small Craft Advisory are locally defined, based on customer requirements. If used, WFOs will notify NWS Western Region HQ (MSD) of their criteria (also if criteria changes).

2.5.3 Use of "Expected" Conditions Headline. When necessary to convey information regarding conditions expected to meet or exceed marine warning criteria (Gale or stronger winds, or seas meeting/exceeding Hazardous Seas Warning criteria), and the expected conditions are forecast to begin beyond normal marine warning issuance periods, forecasters may insert a headline for "Expected" conditions. For example:

"...GALE FORCE WINDS EXPECTED THURSDAY..."

Headlines for "Expected" conditions should normally be limited to those events beginning through the "Day 3 " period. For situations involving exceptionally strong winds or dangerous seas, an "Expected" condition headline may be used for the "Day 4 " period. In all cases, use of this headline should be limited to situations in which forecaster confidence is high.

2.6 Unscheduled CWF Issuance. Refer to NWSI 10-310.

3. Surf Zone Forecasts (SRF). See NWSI 10-310 for general information and guidance on the SRF. WFOs which do not routinely provide rip current outlook information may include this information on an as needed basis in High Surf Advisories/Warnings, Coastal Flood Advisories / Warnings / Watches (CFW) (Ref: NWSI 10-320 and WR Supplement), and the Hazardous Weather Outlook (Ref: NWSI 10-517 and WR Supplement). For WFOs routinely issuing SRFs, High Surf and Coastal Flood Advisories / Warnings / Watches should be headlined in the SRF. Additionally, WFOs routinely issuing SRFs will include a headline in the SRF whenever the risk of rip currents is "HIGH".

3.1 Issuance. In WR, the SRF will be issued daily at **0200 and 1400 (Pacific Local Time)**. The SRF is intended to be issued on a scheduled basis only, but may be updated at WFO discretion if conditions change significantly. The SRF may be issued up to 30 minutes prior to,

but not later than the scheduled issuance times. During unusually heavy workload situations, the SRF may be issued up to 1 hour prior to the scheduled issuance time.

3.2 Format. SRF format is provided in Figure 1. An example SRF is provided in Appendix A.

3.3 Content. SRFs issued by WR offices will contain the following elements:

a. Rip current risk. Use "LOW" or "HIGH" (reference: NWSI 10-310).

b. Surf height (approximate height of breaking waves). For swell information, SRFs may reference the local WFOs Coastal Waters Forecast (CWF).

c. Surf temperature. Specify appropriate range (degrees F).

4. Marine Weather Statements (MWS). See NWSI 10-314 for information and guidance on Marine Weather Statement use, procedures, and format.

5. Forecast Collaboration. WFOs routinely collaborate with adjacent offices and with the Ocean Prediction Center (OPC), as necessary during the forecast process to facilitate or improve consistency of marine forecasts, watches, warnings, and advisories. Forecasters will use available means for collaboration (chat software, telephone, intersite coordination tools (IFPS/ISC), etc.).

Figure 1. Surf Zone Forecast (SRF) Format

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FPZUS KXXX ddhhmm                                  WMO Heading
SRFXXX                                             AWIPS ID

SURF ZONE FORECAST                                 NWS Product Name
NATIONAL WEATHER SERVICE CITY STATE                Issuing Office
time am/pm LT day mon dd yyyy                      Issuance Time/Date

.FOR THE BEACHES OF (specify area)...for (day)...

* THE FOLLOWING INFORMATION APPLIES WHEN FORECAST RIP CURRENT
POTENTIAL IS "LOW":  DUE TO HIGHLY VARIED COASTAL TOPOGRAPHY
DANGEROUS RIP CURRENTS ARE ALWAYS A POSSIBILITY ALONG THE SOUTHERN
CALIFORNIA COAST...AND SWIMMERS ARE URGED TO USE CAUTION AT ALL
TIMES.

CAZXXX-XXX>XXX-ddhhmm-                             UGC Type(Zone)/Exp.Time
Counties                                           County Names
time am/pm day mon dd yyyy                         Issuance Time/Date

...(HEADLINES as needed)...

.TODAY...
SURF HEIGHT...................(specify height in ft)
RIP CURRENT POTENTIAL.........(LOW or HIGH)*
WATER TEMPERATURE.............(specify in degrees F)

REMARKS.......................(as needed)
OUTLOOK FOR (following day)...(outlook for surf height)

$$                                                 This code ends zone
                                                   segment
CAZXXX-XXX>XXX-ddhhmm-                             UGC Type(Zone)/Exp.Time
Counties                                           County Names
time am/pm day mon dd yyyy                         Issuance Time/Date

...(HEADLINES as needed)...

.TODAY...
SURF HEIGHT...................(specify)
RIP CURRENT POTENTIAL.........(LOW or HIGH)*
WATER TEMPERATURE.............(specify in degrees F)

REMARKS.......................(as needed)
OUTLOOK FOR (following day)...(outlook for surf height)

$$                                                 This code ends zone
                                                   segment

FORECASTER ID                                      Optional
Note: All times are local.
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APPENDIX A - Example Surf Zone Forecast

FZUS56 KLOX 182116
SRFLOX

SURF ZONE FORECAST
NATIONAL WEATHER SERVICE LOS ANGELES/OXNARD CA
200 PM PDT TUE OCT 18 2005

.FOR THE BEACHES OF SOUTHERN CALIFORNIA...VALID WED OCT 19…

*THE FOLLOWING INFORMATION APPLIES WHEN FORECAST RIP CURRENT POTENTIAL IS "LOW": DUE TO HIGHLY VARIED COASTAL TOPOGRAPHY, DANGEROUS RIP CURRENTS ARE ALWAYS A POSSIBILITY ALONG THE SOUTHERN CALIFORNIA COASTS, AND SWIMMERS ARE URGED TO USE CAUTION AT ALL TIMES.

CAZ041-190900-
LOS ANGELES COUNTY COAST-
200 PM PDT TUE OCT 18 2005

…HIGH POTENTIAL FOR RIP CURRENTS TODAY…

WEDNESDAY...
SURF HEIGHT.....5-7 FEET
RIP CURRENT POTENTIAL……..HIGH*
WATER TEMPERATURE.....59-68 DEGREES

REMARKS...NONE

OUTLOOK FOR THURSDAY...LITTLE CHANGE

$$

CAZ040-190900-
VENTURA COUNTY COAST-
200 PM PDT TUE OCT 18 2005

...HIGH POTENTIAL FOR RIP CURRENTS TODAY...

WEDNESDAY...
SURF HEIGHT.....4-6 FEET
RIP CURRENT POTENTIAL……..HIGH*
WATER TEMPERATURE.....57-62 DEGREES

REMARKS...NONE

OUTLOOK FOR THURSDAY...LITTLE CHANGE

$$

CAZ039-190900-
SANTA BARBARA COUNTY SOUTH COAST-
200 PM PDT TUE OCT 18 2005

.WEDNESDAY...
SURF HEIGHT.....2-4 FEET
RIP CURRENT POTENTIAL……..HIGH*
WATER TEMPERATURE.....60-63 DEGREES

REMARKS...NONE

OUTLOOK FOR THURSDAY...LITTLE CHANGE

$$